

REMARKS / ARGUMENTS

The action by the Examiner of this application, together with the cited references, has been given careful consideration. Following such consideration, claims 1-6 have been amended to define more clearly the patentable invention Applicant believes is disclosed herein. It is respectfully requested that the Examiner reconsider the claims in their present form, together with the following comments, and allow the application.

The Examiner requires that Applicant submit a copy of Japanese Patent Publication No. 5-67530. Applicant respectfully submits that this document was submitted to the U.S. Patent and Trademark Office when the application was filed. However, the document was identified as "Japanese Patent Application Laid Open No. 1-92107."

As the Examiner well knows, the present invention is directed to an article conveying apparatus for conveying articles between article storage sections and an entry and exit port. The article conveying apparatus can best be seen in FIG. 2 of the present application. The article conveying apparatus includes a platform for supporting articles, a tensioning device, a lower frame, an upper frame, and a pair of cables. As used herein, the term "cables" refers to ropes, chains, or wires used for raising and lowering the platform as disclosed in the specification of the present application (see paragraph [0095]). Two poles 4 extend vertically from longitudinally opposite sides, i.e., the ends, of the lower frame to corresponding opposite ends of the upper frame. The tensioning device (i.e., chain tensioner 26) is disposed on the underside of the platform. Driving wheels 18 are disposed on the lower frame.

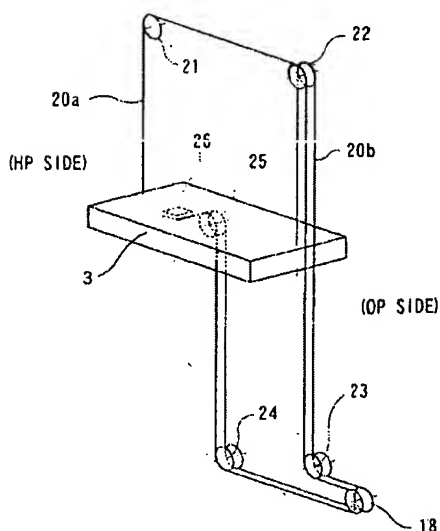


FIG. 7

Referring now to FIG. 7 of the present application (repeated at left), a first cable travels from an upper portion, i.e., top side, of the platform to a guide wheel 21 disposed at the upper end of the conveying apparatus. The first cable travels from guide wheel 21 across the width of the apparatus to guide wheels 22. A second cable travels from the top side of the platform up to guide wheels 22. The pair of cables then travels in parallel downward from guide wheels 22 to guide

wheels 23. The cables continue to travel together from guide wheels 23 around driving wheels 18 to guide wheels 24. Guide wheels 24 are disposed near the central portion of the lower frame between poles 4 (as can be seen in FIG. 2). The pair of cables travels together from guide wheels 24 vertically to the lower portion, i.e., underside, of the platform. The cables are then guided by guide wheels 25 to the tensioning device. The tensioning device is provided for applying a tensioning force to the cables. The tensioning force in the cables is necessary to operate the apparatus.

The arrangement of the guide wheels in the present invention provides mechanical advantages over prior art conveying apparatuses. One advantage of the present invention is that the tensioning device can be attached directly to the ends of the cables. As a result, the tensioning device can apply a tensioning force to the cables in an axial direction.

Another advantage of the present invention is that the cables are positioned clear of the vertical poles as they travel from the lower frame to the underside of the platform. In prior art devices, because the cables are adjacent the vertical poles, high tension in the cables is necessary to avoid interference with the vertical poles. Because the cables are positioned clear of the vertical poles in the present invention, high tension in the cables is not necessary. As a result, the cables of the present invention can be operated with less tension and the overall structure of the claimed apparatus can be made more economically than the prior art.

It is respectfully submitted that none of the cited references teaches, suggests, or shows an article conveying apparatus as presently set forth in the claims, or the advantages thereof.

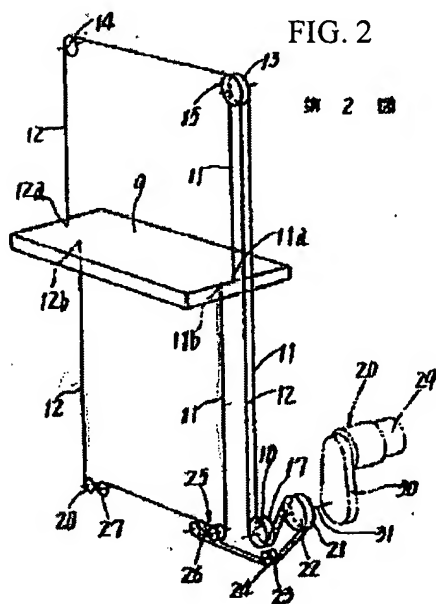
The claims have been amended to replace the term "ropes" with the term "cables." It is believed that the term "cables" is a more appropriate term to describe the chains, wires, and ropes disclosed in the specification (see the present specification, paragraph [0095]).

In response to the Examiner's rejections, claim 1 has been amended to indicate that the raising and lowering cables are guided from the opposite ends of the upper part of the platform and are guided *vertically from the vicinity of the central portion of the running truck body* to a vicinity of a central lower portion of said platform. Thus, the claimed structure provides for a platform supported by a pair of cables. A portion of the cables travels together as

a pair directly from a central portion of a lower frame to a vicinity of a lower portion of the platform.

The Examiner has rejected claims 1-6 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Appropriate corrections have been made by amendment. Accordingly, it is respectfully requested that the Examiner now withdraw the 35 U.S.C. 112, second paragraph, rejection.

The Examiner has also rejected claims 1, 5, and 6 under 35 U.S.C. 102(b), as being anticipated by JP 01-092108 to Tanaka, and claims 2-4 stand rejected under 35 U.S.C. 103, as being obvious in view of the Tanaka reference.



The Tanaka reference discloses a raising and lowering device that includes a platform that is suspended by a pair of cables. The platform travels between an upper structure and a lower structure along vertical masts. As can be seen in FIG. 2 of the Tanaka reference (repeated at left), each cable is attached to an opposite end of the top of the platform. The cables are guided from the platform to the upper end of the raising and lowering device where they are paired together. The cables travel down to the lower end of the device together where they are passed through cable tensioners 25, 26.

Within cable tensioners 25, 26, the cables are partially wrapped around moving rollers 38, 39 (see FIG. 3). Rollers 38, 39 are movable to adjust the tensioning force in the cables. After the cables exit cable tensioners 25, 26, the cables are separated and travel past separate guide wheels (see Ref: Nos. 40, 41, 27, and 28 in FIGS. 2 and 3) such that each cable is near a mast. As shown in FIG. 1 of the Tanaka reference, each cable then travels separately along a vertical mast to opposite ends of the underside of the platform.

The Tanaka reference does not teach, suggest, or show an article conveying apparatus having raising and lowering cables that are "guided vertically from the vicinity of the

central portion of the running truck body to a vicinity of a central lower portion of said platform” as required in claim 1.

Further, in the structure disclosed by the Tanaka reference, the cables are tensioned by applying force to rollers 38, 39. The force on the rollers 38, 39 is significantly greater than the actual tensioning force created in the cables. Accordingly, the cable tensioners must have a firm, more robust, structure. Another problem inherent in the configuration disclosed in Tanaka is that each cable in the Tanaka structure is guided along a mast. The tensioning forces in the cables must be high to prevent the cables from interfering with the masts. Therefore, in addition to a robust tensioning device, the raising and lowering cables must be suitable for high tension use. As a result of the above-described problems, both the cable tensioner and the cables of the Tanaka reference must be substantial and rugged.

The present invention solves these problems by guiding the pair of raising and lowering cables to the vicinity of the central portion of the running truck body, and then together “vertically from the vicinity of the central portion of the running truck body to a vicinity of the central lower portion of the platform.” In this regard, the cables of the present invention remain together after they pass driving wheels 18 and do not travel up to opposite ends of the underside of the platform along vertical poles. The present invention, therefore, should not be taken as being obvious from the Tanaka reference.

Further, the present invention has unexpected results that are not disclosed by the Tanaka reference. That is, the raising and lowering cables of the present invention have only to be set at a minimum tension to engage driving wheels 18. It is thus possible to reduce the burden on the raising and lowering cables. In addition, structure of the tensioning device can be simplified. In this regard, the arrangement of guide wheels in the present invention provides for the cables to be connected to the tensioning device at one end of each cable. As a result, the tensioning force is applied axially to each cable by the tensioning device. In the Tanaka reference, because the structure of the conveying assembly requires that the cables be partially wrapped around rollers in the cable tensioners, the forces acting on the cable tensioners are significantly greater than the tensioning force in the cables. The apparatus defined in claim 1 results in less tension required in the raising and lowering cables. By operating with less tension,

the structure disclosed in the present invention can be manufactured at reduced costs compared to the structure disclosed in the Tanaka reference.

Claims 2-6 depend from claim 1. Thus, it is respectfully submitted that these claims are patentable over the cited references for at least the reasons set forth above in connection with claim 1.

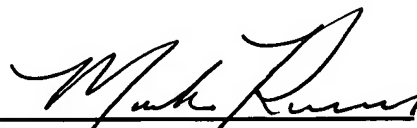
The cited references made of record and not relied upon have also been reviewed. It is respectfully submitted that none of these additional references teaches, suggests, or shows the applicant's invention as defined by the present claims.

In view of the foregoing, it is respectfully submitted that the present application is now in proper condition for allowance. If the Examiner believes there are any further matters that need to be discussed in order to expedite the prosecution of the present application, the Examiner is invited to contact the undersigned.

If there are any fees necessitated by the foregoing communication, please charge such fees to our Deposit Account No. 50-0537, referencing our Docket No. MM8845US.

Respectfully submitted,

Date: April 21, 2006


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I hereby certify that this correspondence (along with any paper referenced as being attached or enclosed) is being deposited on the below date with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to MAIL STOP AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: April 21, 2006


Laura K. Cahill